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Belminus ferroae n. sp. from the Colombian north-east, with a key to the species of the genus (Hemiptera: Reduviidae: Triatominae)

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Abstract

Belminus ferroae, a new triatomine species, is described on the basis of specimens collected in dwellings of the Andean oriental mountain range, municipality Toledo, Departament of North Santander, Colombia. It differs from other species of the genus in the color pattern of the body, corium light colored, cells of the membrane light brown, with secondary venation that gives a reticular aspect to the wing, in design of the connexivum, and phallic structures of the male. Illustrations of male genitalia of *Belminus herreri,* a related species, are included.

Key words: Belminus ferroae, Reduviidae, Triatominae, Colombia.

Introduction

The tribe Bolboderini Usinger, 1944 includes the genera *Bolbodera* Valdés, 1910; *Belminus* Stål, 1859; *Microtriatoma* Prosen & Martínez, 1952; and *Parabelminus* Lent, 1943. The genus *Belminus* currently contains seven species, which occur in Central America, Colombia, Peru, Venezuela, and northern Brazil (Galvão et al. 2003). The species of the genus are: *B. rugulosus* Stål, 1859; *B. costaricensis* Herrer, Lent & Wygodzinsky, 1954; *B peruvianus* Herrer, Lent & Wygodzinsky, 1954; *B. herreri* Lent & Wygodzinsky, 1979; *B. pittieri* Osuna & Ayala, 1993; *B. laportei* Lent, Jurberg & Carcavallo, 1995; and *B. corredori* Galvão & Angulo, 2006. The scarce knowledge of *Belminus* species is restricted to a few morphological papers (Lent & Wygodzinsky 1979, Lent & Jurberg 1984, Rocha et al. 2005). The genus is characterized mainly by the rostrum being very slightly compressed dorsoventrally with its first and second segments elongate, subequal in length, third very short. The base of the scutellum laterally has 1+1 subtriangular processes, and the dorsal connexival segments have a longitudinal submarginal conspicuous pleat (Herrer et al. 1954, Lent & Wygodzinsky 1979).

The genus has been considered to be mainly sylvatic, living arboreally in association with didelphids, rodents, and epiphytic bromeliads, and very rarely domestic (Lent & Wygodzinsky, 1979). *Belminus peruvianus*, *B. herreri, B. corredori* were found colonizing human dwellings (Herrer et al. 1954, Sandoval et al. 2004, Galvão & Angulo 2006). In Colombia only three species have been found, *B. rugulosus, B. herreri,* and *B. corredori* (Moreno et al. 1995, Guhl 1998, Sandoval et al. 2000, 2004, Galvão & Angulo, 2006).

In recent years there has been a revitalization of the programs to control the domestic population of Chagas disease vectors in Latin America. The epidemiological importance of these vectors depends of course on the vectors' ability to spread and to adapt to domestic structures. Therefore, surveys of domiciliation pro-

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cesses are very important and should be accomplished continually.

During an entomological survey in areas suspected to harbor domestic vector populations of triatomines, specimens of a species belonging to the genus *Belminus,* were captured inside dwellings. The field study was carried out in July, 2004, in the department of North of Santander, Colombia, in the municipality of Toledo, locality Santa Catalina (07119879 N, 07232129 W). These specimens were compared with specimens of the seven species of the genus deposited in the Herman Lent and Rodolfo Carcavallo collections of the *Laboratório Nacional e Internacional de Referência em Taxonomia of Triatomíneos*, Oswaldo Cruz Institute, Brazil; of the *Museo del Instituto de Zoologia Agrícola MIZA*, Aragua, Venezuela; the Collection of *Grupo Chagas* of the University of Antioquia, Colombia; and the National Museum of Natural History, Smithsonian Institution, Washington, D.C. These comparisons made clear that these specimens represent a new species, described in the present paper.

Material examined and specimen depository

***Belminus ferroae* n. sp**. **Holotype**: male: COLOMBIA, locality Santa Catalina, municipality Toledo, Norte de Santander. No 3051. **Allotype:** female: COLOMBIA, locality Santa Catalina, municipality Toledo, Norte de Santander. No 3057, **Paratypes:** 5 males: COLOMBIA, locality Santa Catalina, municipality Toledo, Norte de Santander. No 3052–3056. 2 females: COLOMBIA, locality Santa Catalina, municipality Toledo, Norte de Santander. No 3058–3059. All the specimens are deposited in the Herman Lent Collection, maintained by *Laboratório Nacional e Internacional de Referência em Taxonomia de Triatomíneos* (LNIRTT), Oswaldo Cruz Institute, Rio de Janeiro, Brazil. **Paratypes**: deposited in the Collection of the *Laboratorio de Entomología del Instituto Nacional de Salud,* Santa fe de Bogotá, Colombia.

Belminus herreri: 3 males, COLOMBIA, municipality San Martin, Cesar. No 3060–3062 Deposited in the Herman Lent Collection, (LNIRTT), Oswaldo Cruz Institute, Rio de Janeiro, Brazil

Systematics

Family Reduviidae Latreille, 1807
Subfamily Triatominae Jeannel, 1919
Tribe Bolboderini Usinger, 1944
Genus *Belminus* Stål, 1859
Type species *Belminus rugulosus* Stål, 1859

Belminus ferroae n. sp.

Description

Total length of male 11mm, of female 12mm, maximum width of male and female pronotum 3mm, maximum width of male and female abdomen 5mm. Entire body with short golden pilosity, except membrane of hemelytra. Overall color dark brown, the following orange or yellowish: collar including anterolateral processes; 6+6 discal tubercles of pronotum; lateral outer and humeral angles of pronotum; submedian and lateral carinae; scutellar process; external spinelike projection of antenniferous tubercle; distal third of coxae, trochanter, connection between femora and tibiae, and tarsus of all legs; the longer spinelike projection of femora in all legs; distal half of dorsal and ventral connexival segments, including spiracles.

FIGURE 1. *Belminus ferroae* n. sp., male, Holotype, No 3051.

Head fusiform, elongated, wrinkled, granulose (Fig. 2), two times as long as wide (1:0.4), distinctly longer than pronotum (1:0.8). Clypeus truncated apically. Genae compressed laterally, apex considerably surpassing clypeus. External spinelike projection of antenniferous tubercle short, barely extending beyond base of first antennal segment. Second antennal segment with 4 trichobothria. Ratio of antennal segments (1:3:2:2). Anteocular region two times as long as postocular (2:1), latter subcircular, with sides convergent posteriorly. Eyes in lateral view reaching level of lower but not upper surface of the head. Ratio between eye width and synthlipsis (1:2.5). Ocelli very small, but visible. Rostrum brown, reaching prosternum, first segment falling slightly short of level of anterior border of eyes; ratio of rostral segments (1:0.8:0.3).

Pronotum as shown in fig. 1. Fore lobe narrow, sides of fore lobe forming a conspicuous angle with sides of hind lobe. Anterolateral processes short, subtriangular, angular in the apex. Disco of anterior lobe granulose with 6+6 conspicuous tubercles. Carinae of posterior lobe almost attaining posterior border of pronotum.

Scutellar process completely orange-yellowish, subcylindrical, not pointed apically, rugose transversally on dorsum, not sulcate. Prosternum with 2+2 lateral projections, posterior projections more conspicuous Fig (3).

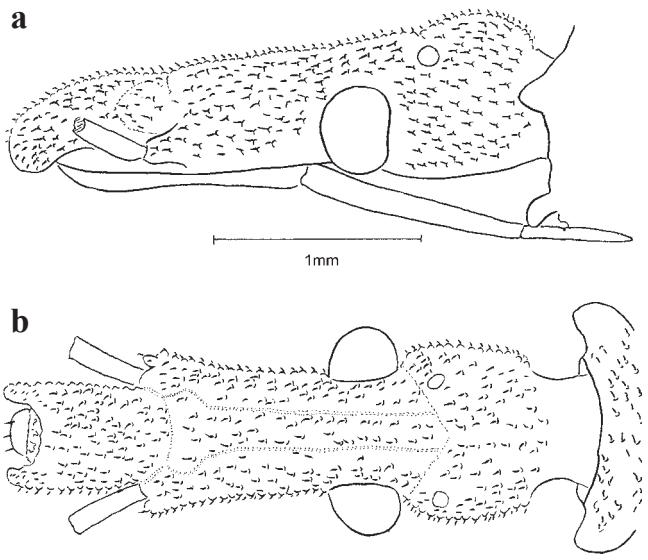

FIGURE 2. *Belminus ferroae* n. sp. Head, lateral view (**a**), dorsal view (**b**).

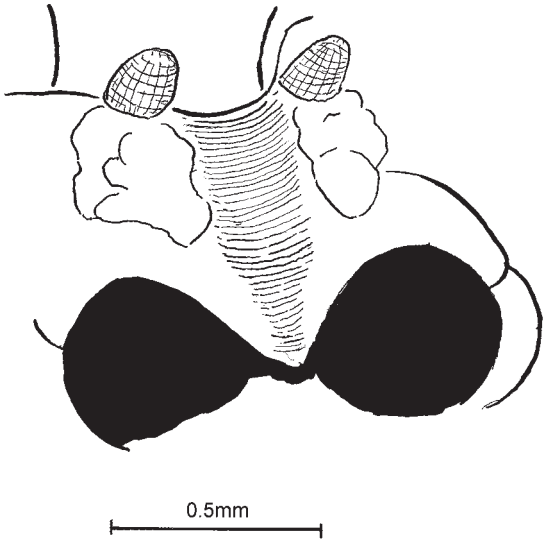

FIGURE 3. *Belminus ferroae* n. sp. Prosternum showing stridulatory sulcus and lateral projections.

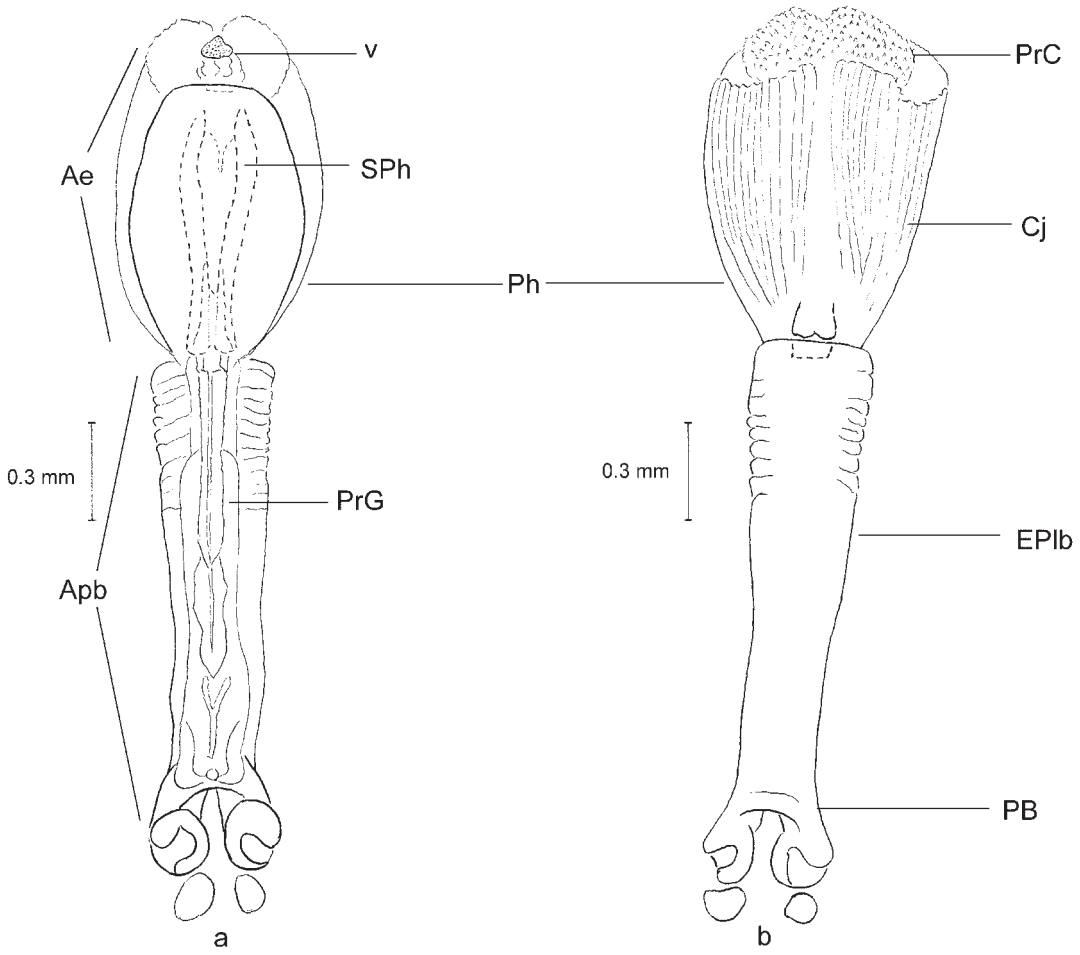

FIGURE 4. *Belminus ferroae* n. sp. Male genitalia. Extended phallus (**a**) ventral view, (**b**) dorsal view.

Abdominal venter flattened longitudinally medially. Hemelytra attaining distal third of seventh tergite in male, in females reaching only anterior half of tergite. Corium light colored with two dark brown areas, one external, central, almost straight, the other internal, flag-shaped. Membrane of hemelytron light brown, contrasting with dark veins. Internal and outer cells of membrane characterized secondary venation, giving wings a reticular aspect (Fig 1).

Legs, short, stout, ventral surface of femora with spinelike processes, three in male, female with 4–5 on fore and midlegs and 3 on hind leg; one of these projections always distinctly longer than all others on each leg. Fore femora more than three times longer than wide. Tibiae slender, smoothly curved. Spongy fossulae absent in male and female, all tarsi three-segmented.

Connexival segments with transverse marks, occupying more of the basal half of the segment, dark marks longer than yellow marks. Yellow areas extending to respective uroesternite, reaching spiracle, except on third segment. Spiracles very close to lateral margin of urosternites.

Male genitalia as in generic description (see Herrer et al 1954, Martinez & Carcavallo, 1976, Lent & Wygodzinsky 1979, Lent & Jurberg 1984, Jurberg et al. 1999). The general aspect of male genitalia of *B. ferroae* n. sp. is similar to those of *B. peruvianus* and *B. laportei*. The genitalia of *B. herreri* have longer phallus with an articulatory apparatus (Apb) longer than the aedeagus (Ae) (Figs. 4,7).

Parameres (Pa) short, cylindrical in both species, curved subapically, rounded in median third, apex with a triangular projection and numerous bristles on external border (Figs. 6,9).

Median process of pygophore (PrP) triangular, pointed, with long pilosity implanted in base (Fig. 10). Articulatory apparatus (Apb) 1.7 longer than aedeagus to *B. ferroae* and 1.6 in *B. herreri* (Figs. 4, 7).

Medium extension of basal plate (EPlb) rectangular, elongated, longer in new species than in *B. herreri* (Figs. 4,5,7,8).

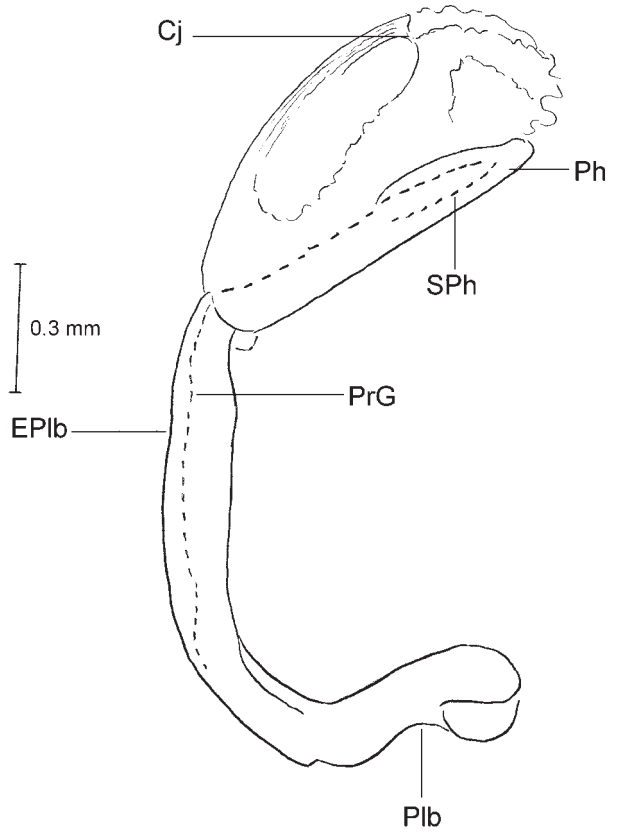

FIGURE 5. *Belminus ferroae* n. sp. Male genitalia. Phallus, semieverted, lateral view.

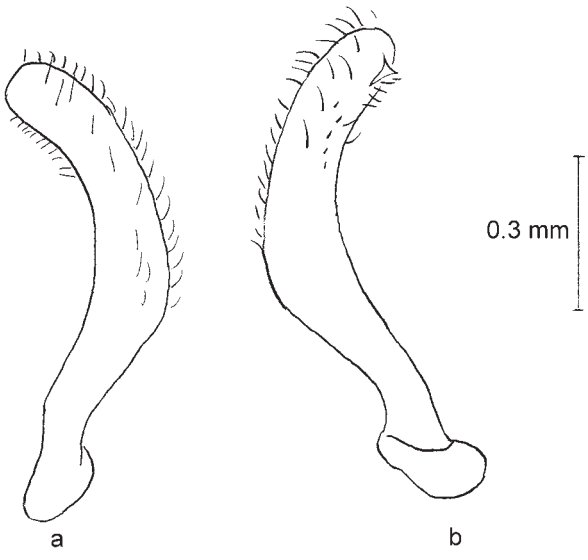

FIGURE 6. *Belminus ferroae* n. sp. Male genitalia. Parameres (**a**) dorsal view, (**b**) ventral view.

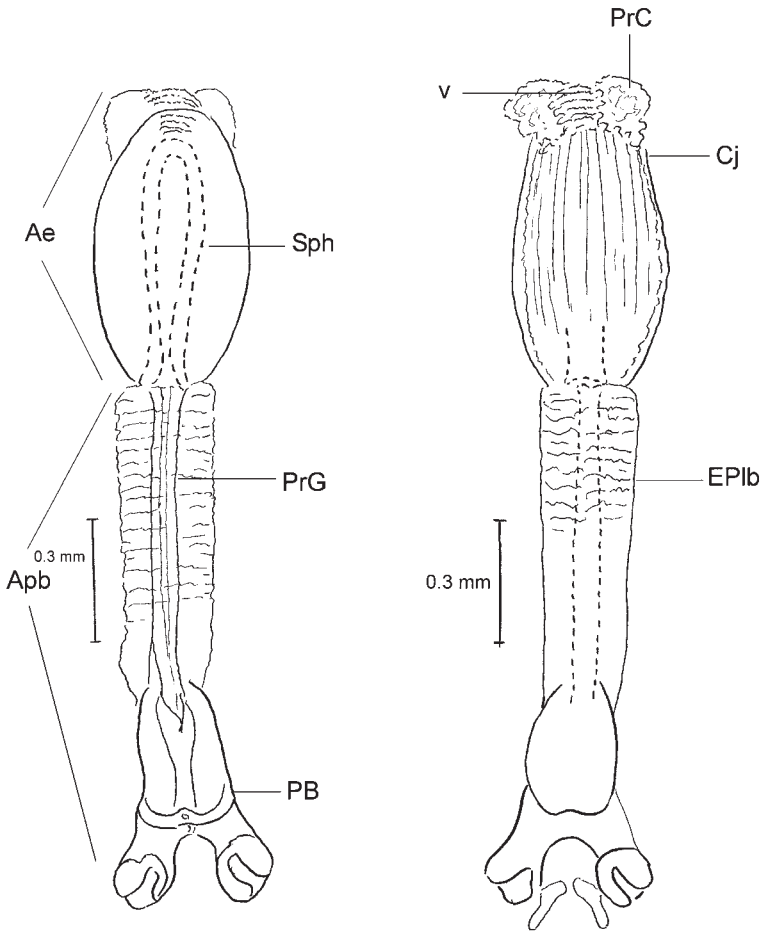

FIGURE 7. *Belminus herreri*. Male genitalia. Extended phallus (**a**) ventral view, (**b**) dorsal view.

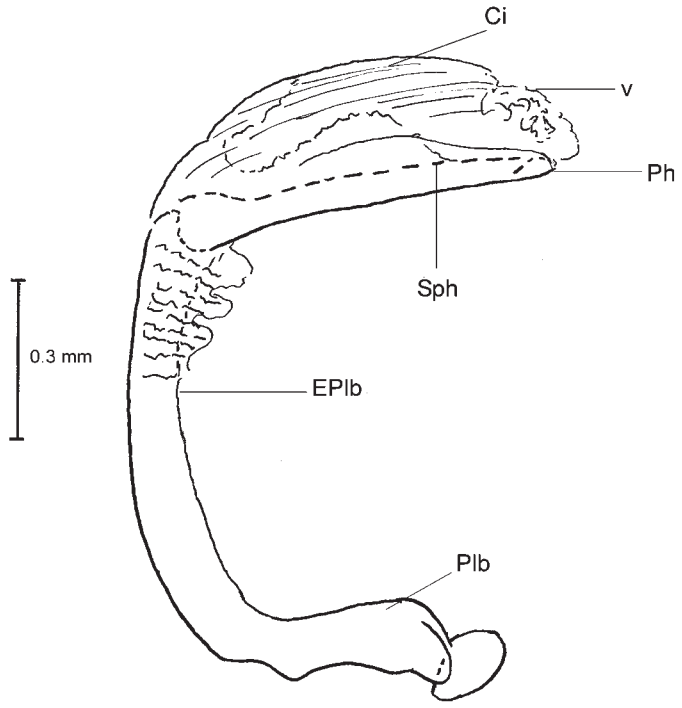

FIGURE 8. *Belminus herreri*. Male genitalia. Phallus, semieverted, lateral view.

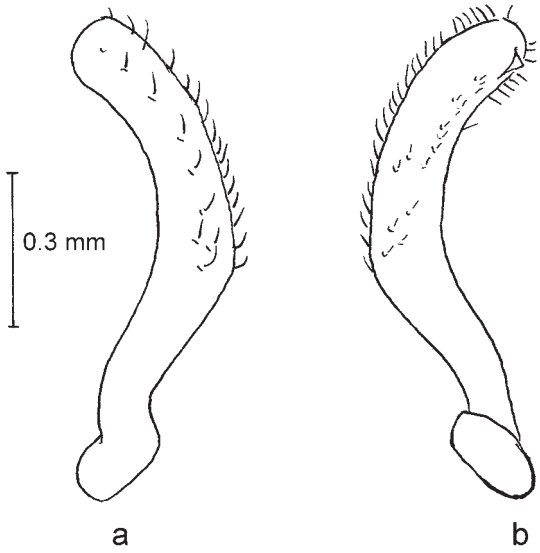

FIGURE 9. *Belminus herreri*. Male genitalia. Parameres (**a**) dorsal view, (**b**) ventral view. .

Basal plate (Plb) connected to base of phallus by medium extension of basal plate (pedicel), divergent arms joined by basal bridge (PB) short and thin.

Gonopore process (PrG) cylindrical, hollow, very long, occupying entire internal face of medium extension of basal plate.

Phallosome (Ph), an ovoid plate, large in new species, with apex and base flattened (Fig. 11).

Phallosome support (struts) (SPh) 1+1 elongate arms, structures cylindrical and hollow, these articulating at their bases with apex of articulatory apparatus. Apex of arms not joined to apex in new species, but joined in *B. herreri* (Figs. 4,7,11).

Conjunctive process (PrCj) are 1+1 alar projections, little sclerotized, located in lateral apex of aedeagus, present in both species (Figs. 4,7).

Vesica (v) present in both species, slightly sclerotized, located at apex of endosoma (Figs. 4,7). Endosomal processes absent in both species.

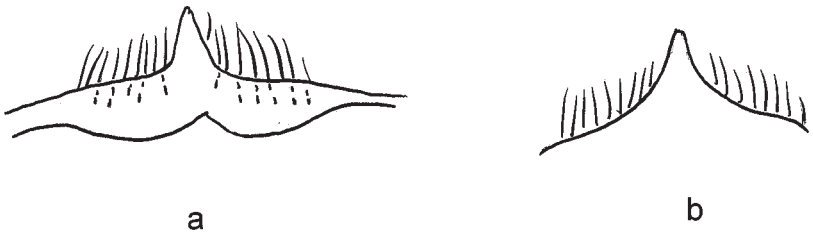

FIGURE 10. Male genitalia. Median process of pygophore. *Belminus ferroae* n. sp. (**a**), *Belminus herreri* (**b**)

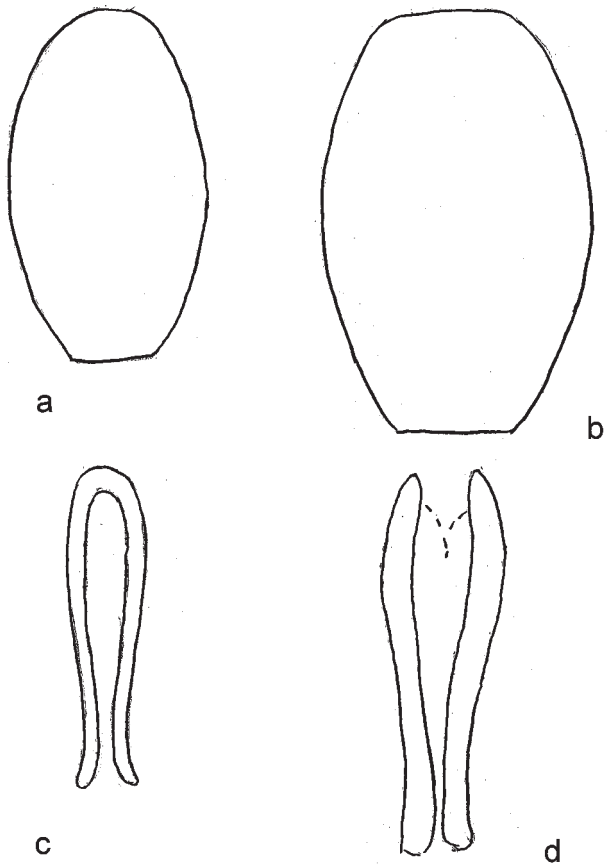

FIGURE 11. Phallus and phallosome support (struts). *Belminus ferroae* n. sp. (**b** and **d**). *Belminus herreri* (**a** and **c**).

Diagnosis

Differentiation of this species from all other species of *Belminus* is based on the overall pattern color, corium light colored, cells of the membrane light brown, contrasting with dark veins, presence of secondary venation giving to the wings a reticular aspect, design of the connexivum, and phallic structures (Fig. 12).

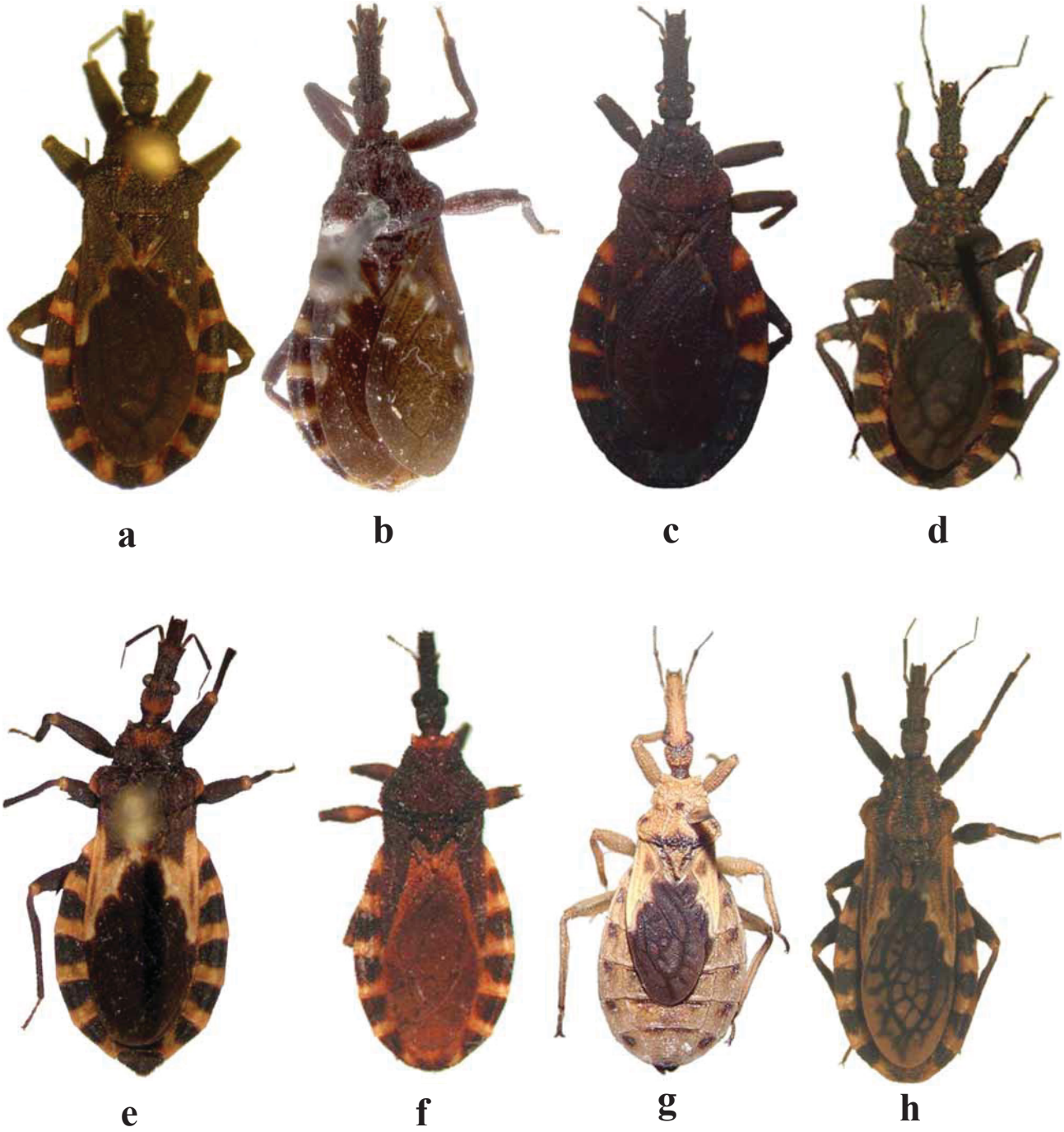

FIGURE 12. Color pattern of *Belminus* species. (**a**). *B. rugulosus*, (**b**). *B. costaricensis*, (**c**). *B. peruvianus*, (**d**). *B. herreri*, (**e**). *B. pittieri*, (**f**). *B. laportei*, (**g**). *B. corredori*, (**h**). *B. ferroae* n. sp

Etymology

This species is dedicated to Cristina Ferro, a Colombian entomologist. She has dedicated her life to research on the medical importance insects in Colombia.

Key to the species of Belminus

1 Overall color light orange, brachypterous insects ..... ***B. corredori***
- Overall color predominantly brown or black, male and female macropterous 2
2 Corium light colored.....3
- Corium almost totally black.....4
3 Overall color dark brown, with several orange or yellowish areas through the body, membrane of hemelytron light brown contrasting with the dark veins. Cells with secondary venation giving to the wings a reticular aspect..... ***B. ferroae* n.sp.**
- Overall color black, with orange areas in connexivum and corium, membrane of hemelytron black, without reticular cells, veins not contrasting with cells..... ***B. pittieri***
4 Pronotum and legs black, with yellow patterns (spots, stripes, or areas) 5
- Pronotum and legs totally black 6
5 Ventral area of connexivum with yellow spots, extended to the border of sternites. Hind femora with a yellow ring..... ***B. herreri***
- Ventral abdomen mainly yellow with black stripes. Hind femora yellow in central two-thirds.. ***B. laportei***
6 Scutellar process compressed and with a conspicuous dorsal sulcus. First rostral segment surpassing the anterior border of the eye in lateral view..... ***B. costaricensis***
- Scutellar process not compressed, with or without a sulcus. First rostral segment not surpassing the anterior border of the eye in lateral view 7
7 First rostral segment almost as long as the second, the first far from the anterior border of the eye in lateral view. Scutellar apical process conical without sulcus ..... ***B. peruvianus***
- First rostral segment longer than the second, almost attaining the anterior border of eye in lateral view. Scutellar process subcylindrical with a narrow longitudinal sulcus..... ***B. rugulosus***

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